Considering Uncertainty in Strategies to Control Invasive Species

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Features of Invasive Species Management Decisions

- Novel or One-Time Decisions
- High Stakes
- Irreversible Consequences
- Severe Uncertainty

Characterizations of Uncertainty in Economics

- Probability
- Surprise
- Fuzziness
- Info-Gap

Info-Gap Models of Uncertainty

- Uncertainty is the difference between what is known and what needs to be known for optimal decision

Info-Gap Model Components

- System Model
- Performance Requirement
- Uncertainty Model
- Robustness Function

System Model

- Expresses the reward which follows from decisions and uncertain factors

Performance Requirement

- Smallest Acceptable Reward

Uncertainty Model

- Incorporates prior information about uncertain variables in the system model

Robustness Function

- Expresses the greatest level of uncertainty at which the performance requirement will be satisfied

Robust Optimal Decision

- A robust optimal decision maximizes robustness

Implications

- Info-Gap requires detailed focus on events
- Info-Gap optimal decision maximizes uncertainty under which goal is achieved